

WHAT IS CLAIMED IS:

Sub P2

1. A rotational molding composition comprising;

5 A) a majority component of one or more homopolymers or interpolymers;

 B) one or more impact additives selected from the group consisting of ethylene-vinyl acetate copolymers (EVA); heterogeneous or homogeneous interpolymers with polymer units derived from ethylene and/or one or more C₃ -C₂₀ α -olefins having a density of 0.915 g/cm³ or less; and one or more substantially random interpolymers comprising;

(1) polymer units derived from

 (i) at least one vinyl or vinylidene aromatic monomer, or

 (ii) at least one hindered aliphatic or cycloaliphatic vinyl or vinylidene monomer; or

 (iii) a combination of at least one vinyl or vinylidene aromatic monomer and at least one hindered aliphatic or cycloaliphatic vinyl or vinylidene monomer; and

(2) polymer units derived from

 (i) ethylene, or

 (ii) C₃₋₂₀ α -olefin;

20 and mixtures thereof;

wherein the impact strength of the composition at a fixed temperature is increased by at least 0.1 ft-lb/in from that of the majority component in the absence of the impact additive.

2. The composition of Claim 1 wherein the majority component, Component A, comprises 70 percent or greater by weight of the composition.
- 5 3. The composition of Claim 1 wherein the majority component, Component A, is selected from polyethylene, propylene homopolymers and copolymers, styrene homopolymers and copolymers, polycarbonates, nylon, polyesters, polybutylene, polyethylene terephthalate, and acrylic polymers; and mixtures thereof.
4. The composition of Claim 1 wherein the majority component, Component A, is selected from ethylene and/or alpha olefin homopolymers or interpolymers, with the density of the ethylene homopolymers or copolymers being greater than 0.915 g/cm³.
5. The composition of Claim 1 wherein the majority component, Component A, is linear low density polyethylene.
6. The composition of Claim 1 wherein the majority component, Component A, is polypropylene.
- 20 7. The composition of Claim 1 wherein the impact additive, Component B, comprises from about 2 to about 50 percent by weight of the composition.
8. The composition of Claim 1 wherein the impact additive, Component B, comprises ethylene-vinyl acetate copolymer comprising from about 2 to about 50 weight percent vinyl acetate.

9. The composition of Claim 1 wherein the impact additive, Component B, comprises substantially random interpolymer comprising from about 1 to about 30 mole percent vinyl aromatic monomer.

5 10. The composition of Claim 1 wherein the impact additive, comprises heterogeneous or homogeneous copolymers of ethylene and 1-propene, ethylene and 1-butene, ethylene and 1-pentene, ethylene and 1-hexene and ethylene and 1-octene of 0.850-0.915 g/cm³ density.

11. The composition of Claim 9 wherein the vinyl aromatic monomer is styrene.

10 12. The composition of Claim 1 which comprises from about 85 to about 95 percent by weight of linear low density polyethylene as Component A, and from about 5 to about 15 percent by weight of ethylene-styrene interpolymer having from about 5 to about 20 mole percent styrene as Component B; wherein the composition is in the form of a powder which is smaller than or equal to 35 mesh.

13. The composition of Claim 1 which comprises from about 85 to about 95 percent by weight of linear low density polyethylene as Component A, and from about 5 to about 15 percent by weight of ethylene-vinyl acetate copolymer having from about 5 to about 20 weight percent vinyl acetate as Component B; wherein the composition is in the form of a powder which is smaller than or equal to 35 mesh.

25 14. The composition of Claim 1 which comprises from about 85 to about 95 percent by weight of linear low density polyethylene as Component A, and from about 5 to about 15 percent by weight of heterogeneous or homogeneous copolymers of ethylene and 1-propene, ethylene and 1-butene, ethylene and 1-pentene, ethylene and 1-hexene and ethylene and 1-octene of 0.850-0.915 g/cm³ density as Component B, wherein the composition is in the form of a powder which has a particle size smaller than or equal to 35 mesh.

30 15. A rotational molding composition comprising;
A) 94 percent by weight or more of one or more thermoplastic polymers; and

B) 6 percent by weight or less of one or more processing additives; wherein the sintering time of said composition will be decreased by at least 5 percent relative to the sintering time of Component A in the absence of Component B.

5 16. The composition of Claim 15 wherein the one or more thermoplastic polymers are selected from the group consisting of substantially random ethylene-styrene interpolymers, ethylene and/or C₃ – C₂₀ α -olefin homopolymers or interpolymers, nylon, polyethylene terephthalate, polycarbonate, acrylic polymer, polystyrene, and mixtures thereof.

10 17. The composition of Claim 15 wherein the amount of processing additive, Component B, is from about 0.01 to about 6 weight percent of the composition.

18. The composition of Claim 15 wherein the processing additive, Component B, is a solid or liquid at from about 20 to about 300°C.

19. The composition of Claim 15 wherein the processing additive, Component B, has a molecular weight below about 10,000.

20. The composition of Claim 15 wherein the processing additive, Component B, is selected from the group consisting of mineral oil, naphthenic oil, paraffinic oil, glycerol monostearate, pentaerythritol monooleate, adipic acid, sabacic acid, styrene-alpha-methyl-styrene, calcium stearate and mixtures thereof.

21. The composition of Claim 15 wherein the processing additive, Component B, is mineral oil.

25 22. The composition of Claim 20 which comprises from about 94 to about 99.9 weight percent of linear low density polyethylene as Component A, and from about 0.1 to about 6 weight percent of mineral oil as Component B; wherein said mineral oil is dispersed within the polyethylene and the composition is in the form of a powder which has a particle size smaller than or equal to 35 mesh.

23. The composition of Claim 20 which comprises from about 99 to about 99.99 weight percent of linear low density polyethylene as Component A, and from about 0.01 to about 1 weight percent of calcium stearate as Component B, wherein said calcium stearate is dispersed substantially homogeneously within the polyethylene and the composition is in the form of a powder which has a particle size smaller than or equal to 35 mesh.

5

Sub A3 ~~24. An injection molding composition; comprising~~

~~A) a majority component of one or more homopolymers or interpolymers; and
B) one or more impact additives selected from the group consisting of ethylene-vinyl
acetate copolymers (EVA); heterogeneous or homogeneous interpolymers with
polymer units derived from ethylene and/or one or more C₃ -C₂₀ α-olefins having a
density of 0.915 g/cm³ or less; and mixtures thereof;~~

~~wherein the impact strength of the composition at a fixed temperature is increased by at least
0.1 ft-lb/in from that of the majority component in the absence of the impact additive.~~

10

25. The composition of Claim 24 wherein the majority component, Component A, comprises 70 percent or greater by weight of the composition.

15

26. The composition of Claim 24 wherein the majority component, Component A, is selected
20 from polyethylene, propylene homopolymers and copolymers, styrene homopolymers and
copolymers, polycarbonates, nylon, polyesters, polybutylene, polyethylene terephthalate, and
acrylic polymers; and mixtures thereof.

20

27. The composition of Claim 24 wherein the majority component, Component A, is selected
25 from ethylene and/or alpha olefin homopolymers or interpolymers, with the density of the
ethylene homopolymers or copolymers being greater than 0.915 g/cm³.

28. The composition of Claim 24 wherein the majority component, Component A, is linear low density polyethylene.
- 5 29. The composition of Claim 24 wherein the majority component, Component A, is polypropylene.
30. The composition of Claim 24 wherein the impact additive, Component B, comprises from about 2 to about 50 percent by weight of the composition.
31. The composition of Claim 24 wherein the impact additive, Component B, comprises ethylene-vinyl acetate copolymer comprising from about 2 to about 50 weight percent vinyl acetate.
32. The composition of Claim 24 wherein the impact additive, comprises heterogeneous or homogeneous copolymers of ethylene and 1-propene, ethylene and 1-butene, ethylene and 1-pentene, ethylene and 1-hexene and ethylene and 1-octene of 0.850-0.915 g/cm³ density.
- 20 33. The composition of Claim 24 which comprises from about 85 to about 95 percent by weight of linear low density polyethylene as Component A, and from about 5 to about 15 percent by weight of ethylene-vinyl acetate copolymer having from about 5 to about 20 weight percent vinyl acetate as Component B; wherein the composition is in the form of a powder which is smaller than or equal to 35 mesh.
- 25 34. The composition of Claim 24 which comprises from about 85 to about 95 percent by weight of linear low density polyethylene as Component A, and from about 5 to about 15 percent by weight of heterogeneous or homogeneous copolymers of ethylene and 1-propene, ethylene and 1-butene, ethylene and 1-pentene, ethylene and 1-hexene and ethylene and 1-octene of

0.850-0.915 g/cm³ density as Component B, wherein the composition is in the form of a powder which has a particle size smaller than or equal to 35 mesh.

35. A rotationally molded or injection molded article prepared using the composition of any one
5 of the preceding claims.

36. A cast film or blown film prepared using the composition of any one of the preceding claims.

37. An article prepared by blow molding, calendaring, or pulltrusion, and prepared from the
10 composition of any one of the preceding claims.

100 90 80 70 60 50 40 30 20 10 0